Hydroxypropyl methylcellulose (HPMC) belongs to the group of non-ionic cellulose ethers in which hydroxyl groups have been substituted with one or more of the three hydroxyl groups present in the cellulose ring. HPMC is hydrophilic (water soluble), that is off-white in color a biodegradable, and biocompatible polymer having a wide range of applications in drug delivery, dyes and paints, cosmetics, adhesives, coatings, agriculture, and textiles.HPMC is also soluble in polar organic solvents, making it possible to use both aqueous and nonaqueous solvents. It has unique solubility properties with solubility in both hot and cold organic solvents.

Nature

Daily chemical grade hydroxypropyl methyl cellulose is a synthetic high molecular polymer prepared by chemical modification with natural cellulose as raw material.

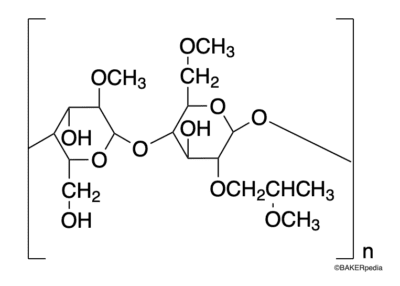
HPMC stands for [hydroxypropyl methylcellulose](https://en.wikipedia.org/wiki/Hypromellose" \t "_blank) or hypromellose for short. HMPC is the material from which most supplement capsules are made. It is a clear, tasteless, vegetarian and vegan appropriate material. It is normally made by extraction from wood pulp.

**HPMC for pharmaceutical capsules, coating and control released agent**

* Item : HYDROXYPROPYL METHYL CELLULOSE
* Appearance : White powder
* Methoxy (%) : 28.0-30.0
* Hydroxypropoxy (%) : 7.0-12.0
* Loss on drying (%) : ≤1.5
* pH : 5.0-8.0
* Water retention ratio : ≤2.0

Several types of HPMC are available commercially in several degrees of substitution, mainly:1, 2.

* HPMC – type C: high methyl and hydroxypropyl content.
* HPMC – type D: high methyl and medium hydroxypropyl content.
* HPMC – type E: medium methyl and hydroxypropyl content.



### Origin

Hydroxypropyl Methylcellulose is obtained from various natural sources, mainly wood pulp and cotton linters. 1

Since 1985, HPMC has been used as a gluten replacement for the manufacture of baked goods.3

**Common HPMC sources:**

Pharmaceuticals

* Supplement capsules
* Drug carrier
* Coating agent
* Emulsifier in ointments
* Tabletting agent
* Eye drops

Food

* Bakery goods
* Ice cream
* Salad dressing
* Sauce mix

Industrial

* Building materials
* Ink
* Printing and dyeing of textiles
* Paper making

**Commercial production**

HPMC is manufactured following this process:1, 2

* Alkalinization: wood pulp cellulose is treated with a 50 wt% sodium hydroxide solution in a reactor.
* Etherification: addition of  methyl chloride followed by propylene oxide to introduce methoxy and propylene glycol groups, respectively.
* Neutralization: using hydrogen chloride solution.
* Purification: HPMC is washed several times with hot water, and  filtered.
* Drying and sizing: the purified product is dried, ground to desirable particle size followed by packaging.

HPMC is used as a raw material for coatings with moderate strength, moderate moisture and oxygen barrier properties, elasticity, transparency, and resistance to oil and fat. It is also used as a tablet binder and as a tablet matrix for extended release

## Lubrication

Improves workability and processing effect of cement-based and ceramic-based extrusions by its lubrication.

## PH stability

Matecel® remains stable in the range of pH 3.0~11.0. The solubility of Matecel® can largely increase in the presence of alkali environment.

## Stable Chemistry

Compatible with other ionic and non-ionic additives in aqueous solutions while providing a stable combination when dissolved in water.

## Save Cost

Large water demand of Matecel® can make your materials yield higher volume of outputs, and thus save your cost.

## Thickening effects

Matecel® Increases viscosity of liquids in daily-chemical products and personal care products

## Suspension effects

Enhances dispersion rate suspension effect and the stability of suspension systems, including concrete, mortar, EIFS system.

## Water retention

Avoid quick water-loss during the drying of constructions, enhance water retention, ensure sufficient hydration time for cement-based, lime-based and gypsum-based materials.

## Open time

Matecel® prolongs the open time during application, give more time for correction.

Viscosity is the resistance of a fluid (liquid or gas) to a change in shape or movement of neighbouring portions relative to one another. Viscosity denotes opposition to flow.

Viscosity is a measure of a fluid’s resistance to flow.

The SI unit of viscosity is poiseiulle (PI). Its other units are newton-second per square metre (N s m-2) or pascal-second (Pa s.) The dimensional formula of viscosity is [ML-1T-1].

The viscosity of liquids decreases rapidly with an increase in temperature, and the viscosity of gases increases with an increase in temperature. Thus, upon heating, liquids flow more easily, whereas gases flow more slowly. Also, viscosity does not change as the amount of matter changes, therefore it is an intensive property.

## Viscosity Formula

Viscosity is measured in terms of a ratio of shearing stress to the [velocity](https://byjus.com/physics/velocity/) gradient in a fluid. If a sphere is dropped into a fluid, the viscosity can be determined using the following formula:

|  |
| --- |
|  |

Where ∆ρ is the density difference between fluid and sphere tested, a is the radius of the sphere, g is the acceleration due to gravity and v is the velocity of the sphere.

This test is harmonized with the European Pharmacopoeia and the U. S. Pharmacopeia. The parts of the text that are not harmonized are marked with symbols (♦ ♦). Disintegration Test is provided to determine whether tablets, capsules, ♦ granules or pills♦ disintegrate within the prescribed time when placed in a liquid medium at the experimental conditions presented below. For the purposes of this test, disintegration does not imply complete solution of the unit or even of its active constituent.

The disintegration process is an integral step in ensuring, and indeed maximising, the bioavailability of the API from the majority of solid dosage forms. With the exception of diffusion - controlled matrix systems, in tablets the wetting and subsequent disintegration of the powder compact is the first step towards the liberation of the API from the dosage form. Without disintegration only the API near the surface of the tablet would be able to dissolve and hence the reproducible and full disintegration of the tablet upon exposure to the dissolution medium is of critical importance to achieve a reliable clinical performance of the dosage form